

this possible, and I for one cannot believe it until I know whether the conflict between the two professors may not be explained by differences in the conditions under which they worked.

We all know how fully Professor Tyndall's time is occupied, but I hope it is not too much to ask him, in the interests of science and for our instruction, to add to the scientific value of his experiments on hermetically sealed flasks by publishing the details, so as to enable us to compare them with the careful account which Prof. Sanderson gives of his, and to judge whether we ought to trust the one or the other or—what would be the more agreeable, and I cannot help thinking the more likely, consequence—to trust them both in this as we have done in so many previous investigations.

INQUIRER

The University of London and School Examinations

HAVING given some assistance to the preparation of the Report referred to in your leader of the 3rd inst., I shall be glad if you will allow me to correct the somewhat erroneous impression which I fear your article is likely to produce.

It was with some surprise that I found the Report of the Sub-committee of the Convocation of the University of London forming the subject of an editorial notice, seeing that, as yet, it is private matter printed only for circulation among the members of the University. At the recent meeting of Convocation I endeavoured to explain the position which the Annual Committee occupied with respect to this Report; and from the absence of all reference to the subject in the notices of the meeting which appeared in the dailypapers, I had reason to think that I had succeeded in showing why the matter was not yet ripe for publication. In answer therefore to your query: "But is it easy to speak with reasonable seriousness of an attitude like that which the Annual Committee has adopted?" I need now only state, with respect to the Report, that it is not yet adopted by Convocation nor by the Annual Committee.

But I am inclined to think that you have lacked the opportunity of carefully studying the proposals of the Sub-Committee, or you would not have found it necessary to speak of them in terms of "irony" or "levity."

Your article suggests that the University of London has been asked to adopt a scheme for the examination of schools with no higher motive than that of "entangling schoolboys in its meshes," and of withdrawing them from the influence of the other Universities; and to establish this position you quote a passage from one of the paragraphs of the Report, in which, *inter alia*, it is stated that unless the University of London is prepared to take some part in the examination of schools "*the number of candidates for the London examinations will sensibly decrease*," which last words you have printed in italics, although in the Report itself no such prominence is given to them. It is quite true that the graduates of Burlington Gardens consider that the influence which their examinations exert on education is, on the whole, beneficial. They are consequently desirous that that influence should if possible be extended, and would view with regret, as the Report suggests, any cause that might tend to dissociate from the University of London those schools which hitherto had acted as feeders to it. But is it quite fair to characterise this honest endeavour to improve school-teaching as an attempt to *entangle schoolboys within the meshes of the University*?

Your article further states that the Annual Committee have not a word to say as to the efficiency of the work in which the ancient Universities have for many years been successfully engaged. Indeed they have: but it is not likely to be found in the Report of the Sub-committee. The several weighty reasons which have induced Convocation to request the Senate to undertake the examination and inspection of schools have been repeatedly and fully discussed by Convocation and its Committee; and the result of these discussions has been the appointment of a Sub-committee for the purpose of suggesting what might seem to them the best and most comprehensive system of examination. Nothing would be easier, in reply to your article, than to show how the proposals embodied in the Report of the Sub-committee, if ultimately adopted by the Senate, would tend to the improvement of secondary education, and would entitle the University of London to receive that "debt of gratitude" which you say "the nation would owe it," if it undertook in good faith to offer to schools a better system of examination than they at present possess. But I am not at liberty to publish the contents of a Report which is at present nothing more than a

series of recommendations which the Annual Committee have accepted as the basis of conference between Convocation and the Senate. I may, however, be permitted to refer to one important feature in that Report which I might have expected would have gained for it the support of a scientific journal such as NATURE—that in the examinations for certificates the same weight is given to Science as to Languages and Mathematics. If the University of London should determine to undertake the new duties to which the Report refers, many schools would be enabled to choose between two systems of examination differing in many essential particulars from each other; but what is more important is the fact that the scheme of the University of London would cover a far wider range of schools than is included within that of the Joint-Board of Oxford and Cambridge; and that those schools which stand most in need of careful inspection would, for the first time, have the opportunity of being affiliated to a University.

In conclusion, permit me to add, that so far from desiring to compete with the older Universities, the Senate of the University of London expressed a strong desire to co-operate with Oxford and Cambridge in their great educational work; and it was not till after the Joint-Board had given reasons why they were unable to act in conjunction with London, that independent action was even suggested.

PHILIP MAGNUS

Feb. 5

WILL you spare me a few lines of space to reply to your first article of Thursday last? A portion of that article was directed against examinations in general, and would apply to the Oxford and Cambridge scheme, as well as to that put forward by our Sub-committee; far more so, in fact, as an important part of our scheme relates to inspection of methods of teaching, school-books, &c., which is not included in the conjoint scheme of the older Universities. Our object is to improve the education given in schools other than primary; and if the author of your article will suggest any method besides examination and inspection by which this may be effected, we will gladly give it our earnest consideration.

Our Report was drawn up for the Annual Committee of Convocation, and not for the outside world. It was not necessary for us to inform Convocation that the University of London has a tradition and principles of its own, principles distinct from, and sometimes antagonistic to those of Oxford and Cambridge. Among these traditional principles are, firstly, that all education ought to be *many-sided*, and not solely either mathematical or classical, and secondly, that Science ought to hold a place co-ordinate with Language and Mathematics. It was not necessary for us to point out to Convocation that if the number of candidates for the London examinations were sensibly to decrease, these two principles would have a diminished influence upon the education of the country, for there is in Convocation a strong attachment to these principles, and a vivid appreciation of the *raison d'être* of the University. Neither was it necessary for us to state what we thought the deficiencies of the Oxford and Cambridge Local Examinations. It was upon the ground that these examinations tended to become too much "an end instead of a means" that we were commissioned by Convocation to draw up a scheme, under which we should rather inquire whether the schools have done well what they profess to have done than dictate to them what course of studies they should pursue. A careful comparison of our scheme with that of the Conjoint Board will make the divergence of aim apparent.

And now we are advised to admit that we have no independent mission as a University, and to stand by to see whether or not the older Universities will do our work, on the ground that it would be a "more dignified course." Dignity and usefulness often appear to stand in inverse relation one to the other. The University does not exist for the sake of being dignified, but of doing work; and the scheme we have elaborated will, if carried out, do work not even proposed by the Conjoint Board. That Board is intended to deal only with such schools for boys as have a governing body, whereas our scheme includes "private adventure" schools both for boys and for girls.

Finally, I may be allowed to express my surprise that NATURE should desire the one University which gives Science its true position to stand aside, and should characterise our wish to assert and to spread its distinctive principles as "cynical."

Hampstead, Feb. 5

H. A. NESBITT

[THE Convocation of the University of London is a very large body, and its proceedings, are reported in the daily papers. A

document which was communicated to every member of that body, and the consideration of which formed part of its proceedings, can only by a legal fiction be described as confidential. But the plea that the document was confidential practically abandons the defence of it. A really statesmanlike paper on a matter which affects all the higher grade schools of the country would gain rather than lose by publicity.

The course which Convocation has under consideration has no doubt, as our correspondents point out, much to be said in its favour. But the reason actually put forward in the preamble of the Report as a ground for taking action, is from the point of view of public policy simply indefensible. It would be appropriate enough if the Report had been addressed by a Board of Directors to the shareholders of a Limited Liability Company, because in the fashion characteristic of such documents it treated the matter in hand from the strictly business point of view of the "concern." It is this attitude which we described as cynical. And we must repeat that it is not in our opinion decorous that a matter gravely affecting the higher education of the country should be treated simply as a question of the falling off of examiners at one particular centre of examination. If it is not the duty of a University to be dignified, it is at least the duty of its advisers to be statesmanlike; and if we may have done injustice to the real desires of the framers of the Report, they have only their own inadequate expression of them to blame.—ED.]

Public Analysts

IN your last week's issue your correspondent, Mr. M. Williams, writes in such terms as would lead your readers to suppose that much less has been done in the matter of butter analysis than is really the case.

I have not the letter before me at this moment, and therefore speak from memory, but I believe that your readers are led to understand that no analyses of pure butter and of pure butter mixed with known quantities of foreign fats have been published. In this he is mistaken, for in a little work published in 1874, the details of eleven experiments upon butters known to be pure are given. The samples were purchased from outlying country farms in the Isle of Wight, and the results of the analyses fairly prove the constancy of the fixed fatty acids in butter.

It is also shown that all foreign fats likely to be used as adulterants are constant in their composition, and that they yield a much larger percentage of fixed acids than does butter; the range of difference being wide enough to offer a practical basis upon which to found accurate estimations of foreign fats in factitious butters. Many admixtures were made, and the published results of the analyses prove the practicability of the method employed. Your correspondent hints that no one dares to undertake the analysis of mixtures of known constitution. I venture to state that if the necessary provisions could be made against concoctions chemically prepared, and so as to admit of commercial admixtures only, such as would be likely to be made use of by fraudulent butter factors, there would be no difficulty in getting half-a-dozen or more analysts ready to take up the gauntlet.

ARTHUR ANGELL

Southampton, Feb. 7

Large Meteors

A LARGE fireball was seen here this evening at about 7.35 P.M. It rolled slowly across the southern sky, and its path was slightly descending from left to right. The observed part of its course was from γ Orionis to a few degrees below α Ceti. There was no train, but the moon was shining brightly at the time, and may have overpowered any faint appendage of this sort. It was many times brighter than Venus (then near setting), and estimated to equal one-fifth the moon's apparent diameter. The globular form of the nucleus was very evident.

A meteor with very slow motion and a short course was observed on Feb. 2, 8.31 P.M., traversing a space between δ Leonis and Cor Caroli, or just above Coma Berenicens. It was as bright as Mars. Radiant point probably near γ Leonis, and very possibly a member of the same system as the fireball described above, which also appears to have been directed from Leo.

A bright meteor was also seen here on Jan. 31, 9.13 P.M. It fell almost vertically in S.S.W. from the Hyades, and must have been quite equal to Venus. I saw it in a region of the sky covered with thin clouds sufficiently dense to obscure the stars. Radiant point probably just north of α Tauri.

Ashley Down, Bristol, Feb. 5

WILLIAM F. DENNING

The Flame of Common Salt

I SEE that it is sometimes permitted to ask questions in NATURE for information. If I might be allowed to do so, I would ask why common salt gives a blue light when cast into a fire of coal, and a yellow light when burned on the wick of a spirit lamp? The books I have consulted do not give the reason of this.

E. G.

OUR ASTRONOMICAL COLUMN

THE BINARY STAR η CASSIOPEÆ.—Dr. Doberck, of Col. Cooper's Observatory, Markree Castle, has communicated to the Royal Irish Academy the results of a complete discussion of the elements of this binary from the measures to 1875. Though he does not consider the exactness of the orbit to be great, partly owing to the observations being rather unfavourably placed, and partly to uncertainty in the observed distances, the agreement with observation is pretty close, and it appears likely that preference may be given to his elements, over those lately given by Dr. Duner, if the latter are correctly printed. Dr. Doberck's orbit is as follows, being the result of a sixth approximation:—

Peri-astron passage ...	...	...	1909 ²⁴
Node ...	...	...	39° 57'
Peri-astron from node ...	...	...	223° 20'
Inclination ...	...	...	53° 50'
Excentricity ...	...	...	0.5763
Semi-axis major ...	...	...	9".83
Period of revolution ...	...	...	222 ⁴³⁵ years.

Combining these values for the semi-axis and length of revolution, with Mr. Otto Struve's parallax ($0''.154$), we have the following figures:—

Semi-axis major ...	...	63.83 earth mean distances.
Mass of system ...	...	5.25 sun-masses.

The parallax corresponds to a distance of 1,340,000 times the mean distance of the earth from the sun. The uncertainty attending the measures of distance of the components and the amount of probable error of Mr. O. Struve's value of the parallax, of course allows only of the above figures being regarded as first rough approximations. The semi-axis of the orbit of η Cassiopeæ, it will be seen, results more than twice as great as that of the orbit of Neptune.

The star will doubtless be frequently measured in the present approach to the peri-astron, and every additional five years' observations must be of service in the improvement of the elements.

Dr. Doberck promises an investigation of the orbit of the close binary ω Leonis, no one of the orbits of which star, so far published, represents recent measures. Notwithstanding the case is a troublesome one for calculation, a very fair approximation to the elements should now be practicable.

THE RUGBY (TEMPLE OBSERVATORY) CATALOGUE OF DOUBLE STARS.—Following the excellent plan pursued by Mr. J. Gurney Barclay in the speedy publication of the Leyton measures of double-stars, made by Mr. Talmage with the fine ten-inch refractor of that observatory, Mr. J. M. Wilson and Mr. G. M. Seabroke have given to astronomers (Memoirs, R.A.S., vol. xlii.) a catalogue of micrometrical measures of these objects made at the Temple Observatory of Rugby School during the years 1871-74, with the 8 $\frac{1}{4}$ -inch Alvan Clark refractor, constructed for the late Rev. W. R. Dawes, used by him in his later measures, and now the principal instrument of the Rugby establishment. Working in this interesting branch of astronomy, in co-operation with Mr. E. Crossley's Observatory near Halifax, Rugby has occupied itself upon the even-numbered stars of Struve's Catalogue below 50° N. declination, Mr. Crossley, with Mr. Gledhill, having employed his 9 $\frac{1}{2}$ -inch refractor upon other stars.

The Dawes-refractor is well spoken of by the Rugby